THE

NEW ENGLAND

Journal of Dentistry.

Vol. III. OCTOBER, 1884. No. 10.

ORIGINAL COMMUNICATIONS.

A CONDENSED HISTORY OF HISTOLOGICAL OBSERVATIONS.*

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It was appreciated in a measure by Aristotle, who was born 384 years before Christ, that animals and plants, however complex their organization, are composed of a limited variety of elementary parts constantly recurring. It seems, however, to have been more clearly conceived by the father of medical science, Galen, who lived 400 years later. Aristotle distinguished as "partes similares" those structures, such as bone, cartilage, fat, flesh, blood, lymph, nerve, ligament, tendon, membrane, vessels, nails, hairs and skin, not confined to one part of the body, but distributed throughout it generally. He applied the term "partes dissimilares" to the regions of the head, neck and extremities. We are indebted to Fallopius of Modena, 1523 to 1562, for our knowledge of the conceptions of Galen, in regard to these "partes similares." These, however, do not correspond to the "elementary parts" or cells of Schwann. Prof. Huxley says in his essay on "The Cell Theory," "they were ultimate to Fallopius because he could go no further, though it is, of course, a

*From the Transactions of the Dental Society of the State of New York, 1884.

very different matter whether we are stopped by the imperfection of our instruments of analysis, as these older observers were, or by having really arrived at parts no longer analyzable." These "partes similares" really correspond to the "tissues" of the present day, which are collections of elementary parts. That the Egyptians knew something of the magnifying properties of lenses, as well as the Greeks and Romans, over 2,000 years ago, seems quite probable, from the fact that a table of refractive powers is introduced into his "Optics" by Ptolemy. Aristophanes, the Athenian poet (B. C. 500), speaks of "burning spheres" of glass as sold in the grocers' shops at Athens, and both Pliny and Seneca refer to lenses and their magnifying properties. Some of these lenses have been found in the ruins of Nineveh, Herculaneum and Pompeii. Compound microscopes, however, did not become available till about the year 1590, about which time Jansens, father and son, are said to have invented it. Fontana, in 1646, writes that he had invented the microscope in 1618. Galileo, in 1612, is said to have sent a microscope to King Sigismund, of Poland; whether it was of his own invention or not cannot be determined. Whoever the original inventor may have been, it is certainly impossible to estimate the assistance this instrument has been to succeeding generations in opening up the minute structure of animals and vegetables. Prof. Huxley says: "The influence of this mighty instrument of research upon histology can only be compared to that of the galvanic battery in the hands of Davy, upon chemistry. It has enabled *proximate* analysis to be *ultimate*.

The time prior to the invention of the compound microscope may be considered as the *first period* in *histology;* that between this date and that of the observations of Schleiden and Schwann (1838) the *second period*, and since that time the *third period*. Barellus, of Pisa, seems to have used the microscope in the examination of the structures of higher animals about the year 1656.

According to Boerhaave, Swammerdam had recognized the blood-corpuscles in the frog in 1658. Malpighi, between 1661 and 1665, had seen the blood-corpuscles in the hedge-hog, had witnessed the circulation of the blood, and had published observations upon the minute structure of the lungs—which he compared to a racemose gland—of the kidneys, spleen, liver, and membranes of the brain.

In 1757 Haller made the first intelligent attempt at building up the tissues by an ultimate physical element, to correspond with the "atom" of the inorganic chemist. "He resolved the solid parts of animals

and vegetables into the 'fibre,' and an 'organized concrete.' To the former he assigns the most important position, asserting that it is to the physiologist what the line is to the geometrician; that a 'fibre' in general may be considered as resembling a line made up of points having moderate breadth, or rather as a slender cylinder." In 1759 to 1774 Wolff promulgated a theory, given as follows by Prof. Huxley: "Every organ is composed at first of a mass of clear viscous, *nutritive fluid*, which possesses no organization of any kind, but is at most composed of globules. In this semifluid mass cavities are now developed: these, if they remain rounded or polygonal, become the subsequent cells, if they elongate, the vessels; and the process is identically the same, whether it is examined in the vegetating point of the plant, or in the young budding organs of an animal. Both cells and vessels may subsequently be thickened by deposits from the 'solidescible' nutritive fluid. In the plant the cells at first communicate, but subsequently become separated from each other; in the animal, they always remain in communication. In each case they are mere cavities and not independent entities; organization is not affected by them, but they are the visible results of the action of the organizing power inherent in the living mass, or what Wolff calls the 'vis essentialis.' Two points are here to be particularly observed as cardinal—first, the non-independence of cells, either anatomically or physiologically; that they are effects, *passive results*, and *not* causes of a vitalizing or organizing force; second, that organization takes place from the 'differentiation' of the homogeneous living mass in these parts through the agency of the 'vis essentialis' or inherent vital force."

Among the first to express himself clearly upon the cellular or vesicular composition of animal organisms, as well as vegetables, was Oken, who, in 1805, in his work on "Generation," speaks of elementary parts as "vesicles," and who says, "The first transition of the inorganic to the organic is the conversion into vesicle which I in my theory of generation have called 'infusorium.' Animals and plants are throughout nothing else than manifoldly divided or repeating vesicles."

In opposition to the "fibre" theory, then so prevalent among histologists, the "globular" theory was advanced in 1779. It is true that Leuwenhock, as early as 1687, announced the "*globular*" structure of the primitive tissues of the body, but this theory attracted very little attention until this period of reaction against the "fibre,"

when it claimed the attention of Prochaska (1779), Fontana (1778), the brothers Wenzel (1812), Treviranus (1816), Bauer (1818, 1823), Heusinger (1822), MM. Provost and Dumas, and Milne-Edwards (1823), Hodgkin (1829), Baumgartner (1830 to 1842), Frederick Arnold (1836), Dutrochet (1837), Raspail (1839); all except Hodgkin admitting, in greater or less degree, the importance of the globule as an ultimate physical element. It seems at the same time that no little confusion existed in the use of terms, the words *globule*, *granule* and *molecule* being often indiscriminately used.

It should here be mentioned that in 1828, Dollinger announced that the tissues of the body are built up of blood-corpuscles, which move in walless channels in these tissues.

It would seem from the foregoing facts very evident that for some years previous to 1838 the cell had been recognized as a constantly recurring element in vegetable and animal tissues, though little importance had been attached to it as an element of organization. Raspail tells us in 1837, that in the condition of development, there are vesicles or cells endowed with life and the property of reproducing out of themselves other cells of the same structure and endowments.

Previous to this, however, a most important discovery was made, viz: the "nucleus," by Dr. Robert Brown, of Edinburgh, 1833. He failed, however, to appreciate its importance, though its discovery was another fact added to those necessary to complete the data on which has been founded the so-called "cell theory."

The pre-existence of the nucleus, and the gradual development of the cell about it, Valentin attempted to demonstrate in the case of pigment cells, C. H. Schultz in the blood-corpuscles, Rudolph Wagner in the egg, and Henle in epithelium, all before the works of Schleiden had appeared. Valentin too, had said, when describing the nucleus of epidermic cells, which he first pointed out, that they reminded him of the nucleus of the cells of vegetable tissues. Dr. Waldo J. Burnett states Valentin "perceived the true physiological relations of cells as far as he well could without apprehending the grand fact that the nucleated cell is the fundamental expression of organic forms."

In the year 1838, Schleiden pointed out the formation of cells in vegetable structures, according to a single and uniform method, and elaborated the theory of development of which the cell was the unit, and which Schwann immediately applied to animal tissues. One

obstacle, however, presented itself in the way of a law of development, applicable alike to animal and vegetable tissues, namely, that animal tissues are furnished with vessels, in which respect they essentially differ from plants; an independent vitality being ascribed to the elementary particles of vegetables growing without vessels. This obstacle had, however, been in a measure removed, in 1837, by Henle, who showed that an actual growth of the elementary parts of epithelium took place without vessels. Taking up the nucleus as discovered by Dr. Robert Brown, Schleiden in referring to its function, gives it the name of "*cytoblast.*" I will not weary you with the conclusions which he arrived at, as to the formation of cells, their reproduction, etc., etc., but will refer you to Tyson's "Cell Doctrine," from which much of this paper is quoted.

The merit of Schwann consisted in applying the theory of Schleiden to animal tissues. Thus, in a "*cytoblastema*" (cell contents), either structureless or minutely granulous, "a nucleolus is first formed; around this a stratum of substance is deposited, usually minutely granulous, but not at first sharply defined on the outside. As new molecules are constantly being deposited in this stratum between those already present, and as this takes place within a precise distance of the nucleolus only, the stratum becomes defined externally, and a cell nucleus, having a more or less sharp contour, is formed. The nucleus grows by a continuous deposition of new molecules between those already existing, that is by intussusception. If this go on equally throughout the entire thickness of the stratum, the nucleus may remain solid; but if it go on more vigorously in the external part, the latter will become more dense, and may become hardened into a membrane, and such are the hollow nuclei. At a certain stage of development of the nucleus the cell is formed around it, to wit, a stratum of substance, which differs from the cytoblastema, is deposited upon the exterior of the nucleus. In the first instance this stratum is not sharply defined externally, but becomes so in consequence of the progressive deposition of new molecules. The deposition of new molecules between those already existing proceeds, and is so effected that when the stratum is thin the entire layer, and when it is thick only the external portion, becomes gradually consolidated into a membrane."

"Immediately that the cell membrane has become consolidated its expansion proceeds as the result of the progressive reception of new molecules between the existing ones; that is to say, by virtue of a

growth by intussusception, while at the same time it becomes separated from the cell nucleus. The interspace between the cell membrane and the cell nucleus is at the same time filled with fluid, and this constitutes the *cell contents.* During this expansion the nucleus remains attached to a spot on the internal surface of the cell membrane." In this manner, according to Schwann, the animal cell is formed. He believed that the cell wall was the most active constituent of the cell; that it possessed the power not only of producing physical and chemical changes in its own substance and the cell contents, but of secreting materials from the surrounding substance and depositing them in its interior; thus it was that glands secreted, and fat was formed in some cells, pigment in others, etc. etc.

From 1840 to 1846, Henle, Bergman, Reichert and others, published the results of observations, but their conclusions were so nearly in accordance with those of Schwann that it would be too much of a repetition here.

In the same year, 1840, Martin Barry made some interesting observations, in the publication of which he states "that the germinal vesicle (the nucleus) and its contents constitute throughout the animal kingdom the most primitive portion of the ovum," that the germinal vesicle returns to the center of the cell, etc. Again he says, "the germinal vesicle fills with cells, and these become filled with the foundation of other cells, so that the germinal vesicle is gradually rendered opaque."

In 1845, Prof. John Goodsir published his paper on "Centres of Nutrition," in which he clearly grasped the two important principles of the modern Cellular Pathology; first, the activity of these centers (nuclei), their power to draw from the capillary vessels, or from other sources, the materials of nutrition, and to distribute them by development to each organ or texture after its kind; second, the origin of such centres, or nuclei, from previously existing nuclei. "From this it follows, not only that the entire organism, as has been stated by the authors of the cellular theory, consists of simple or developed cells, each having a peculiar independent vitality, but that there is in addition a division of the whole into departments, each containing a certain number of developed cells, all of which hold certain relations to one central or capital cell, around which they are grouped. Again, a nutritive center, anatomically considered, is merely a cell, the nucleus of which is the permanent source of successive broods of young cells, which from time to time fill the cavity of their parent, pass off

in certain directions and under various forms, according to the texture or organ of which their parent forms a part."

In 1853 to 1855 the observations of Remak were published. They consist mostly, however, of a discussion of the manner in which new cells are formed. We have already alluded to Prof. Huxley in connection with Wolff. We find, however, in the same paper (1853) some views of his own which in this connection are worth considering, to wit: "Vitality the faculty, that is, of exhibiting definite cycles of change in form and composition, is a property inherent in certain kinds of matter. There is a condition of all kinds of living matter in which it is an *amorphous germ*—that is, in which its external form depends merely on ordinary physical laws, and in which it possesses no internal structure." He termed the cell nucleus the "endoplast," and the cell wall the "periplast," which of necessity implies a vesicle with a "central particle." That there is no "evidence that any attraction or other influence is exercised by the one over the other," the changes which each subsequently undergoes though they are in harmony, having no casual connection with one another. "We have therefore maintained the broad doctrine established by Wolff, that the vital phenomena are not necessarily preceded by organization, nor are in any way the result or effect of formed parts, but that the faculty of manifesting them resides in the matter of which living bodies are composed, as such; or to use the language of the day, that the vital forces are molecular forces."

In J. Huges Bennett's (1855) "Practice of Medicine," he says: The ultimate parts of organization are not cells nor nuclei, but the minute molecule from which these are formed. They possess independent physical and vital properties which enable them to unite and arrange themselves so as to produce higher forms. Among these are nuclei, cells, fibres and membranes, all of which may be produced directly from molecules. Prof. Bennett believed in the spontaneous origin of animal life, which position he openly advocated.

In 1856 Todd and Bowman published the results of their researches, but the conclusions arrived at were in no essential features different from some of those previously given.

About two years later (1858) Virchow published his "Cellular Pathology." According to him the cell is the only possible starting-point for all biological doctrines. The cell can only originate from a previously existing cell, taking its primary origin from the ovum. The typical cell as described by him consists essentially of "cell

wall," "cell contents" and "nucleus." The *nucleolus* he did not consider an essential constituent of the cell. The object of the "nucleus" he considered as entirely connected with the *life* of the cell, that which maintains it as an element, and from which other cells were produced. While to the cell contents, aside from the nucleus, is due the function of the cell, that to which is due the contility of muscle, the neurility and sensation of nerve, and the secretory offices of the gland cell.

Dujardin had, in 1835, discovered in the lower animals a living, moving, contractile substance which he called "*Sarcode*." The peculiar appearances of this substance attracted the attention of many observers. It was thought peculiar to the lower animals, and there was assigned to it a property of "irritability without nerves." The discovery which, however, followed, of similar movements and changes in form, in colorless blood-corpuscles, pigment cells and elsewhere, led Kölliker to express the conjecture that the contents of all cells are contractile.

In 1858, Max Schultze first showed the analogy between "Sarcode" and the contents of the animal cell, and that the entire infusorial world, simple or compound, is made up of cells, which he defined as "*protoplasm* surrounding a nucleus." "The cell leads in itself an independent life, of which the protoplasm is especially the seat, although to the nucleus also undoubtedly falls a most important though not yet precisely determined rôle. Protoplasm is for the most part no further distinct than that it will not commingle with the surrounding medium, and in the peculiarity that with the nucleus it forms a unit."

In April and May, 1861, Prof. Lionel S. Beale delivered the lectures before the Royal College of Physicians of London, in which he promulgated his views, which have since been more or less elaborated, and which have become associated with his name. The "cell" or "elementary part," as he prefers to call it, is composed of matter in two distinct states, viz., matter which is forming and matter which is formed; matter which has the power of growing by producing matter like itself out of pabulum or food, and matter which possesses no such power, but results from the death of the forming matter. The former is known as germinal or living matter, the latter as formed matter. The former in varying quantity in different cells, is central in its situation, and includes what has been called by other observers nucleus, cell contents, protoplasm, endoplast, etc. The latter, also

present in different quantity in different cells, is peripheral, and includes what is known as cell wall, periplast, inter-cellular substance and products of secretion. He is of the opinion that the amœba, the mucus-pus and white blood-corpuscles are composed almost purely of "germinal matter." In its endowments and properties, germinal matter is acting, living, growing and moving, through some inherent power of its own. It alone, as he believes, is capable of producing material like itself out of pabulum, and of multiplying by division, or dropping off a portion of itself, which portion assumes an independent existence, and grows, maintains and reproduces itself like the parent germinal matter. This germinal matter is capable of being stained with an ammoniacal solution of carmine; the latest formed or central portion staining more deeply than that portion immediately surrounding it, and the further from the center of the mass, the lighter is the color, until the formed matter is reached, which takes no color at all.

It must be understood that what is called nucleus by Virchow and others does not constitute the whole of the germinal matter of Beale.

There may be other older germinal matter outside of the nucleus, on its way to conversion into formed material, but still possessed of life, and which assumes a tint with carmine, but not as deep as the nucleus, or center. Formed material, he says, instead of being active is passive, non-acting, dead, and can increase only at the expense and death of the germinal matter, on the periphery of which it is formed.

Beale, however, took the most active tissues of the animal body, to wit, the muscles and nerves, for formed material. This position was vigorously assailed by Bastian, who showed the weakness of Beale's theory upon the ground mentioned. The nucleus itself was shown by Brucke to be often missing, and by no means a constant part or portion of the cell. He also conceived the possibility of the granules being secondary products of the protoplasm, so much so that in his views the cell was a lump of protoplasm destitute of a distinct structure, and often lacking a nucleus. In this view he was followed by all German histologists, including S. Stricker, the editor of the Manual of Histology, the publication of which began in 1868, and was finished in 1871. Quite a discussion arose at that time among the savants as to the propriety of the term cell, and as to the necessary properties of a lump of protoplasm which would entitle it to the name of a cell.

New views as to the structure of protoplasm and tissues were announced by C. Heitzmann in 1873. This observer discovered a reticular structure in a number of protoplasmic lumps, both in isolated individuals, such as amœba, colorless blood-corpuscles, etc., and constituent parts of tissues, such as cartilage corpuscles, epithelia, etc. The reticular structure of so-called protoplasm seems to have been first noticed by Alexander Nasmyth in 1839, who gives illustrations of this reticulum, but no comment upon it. The reticulum in the nucleus was first seen by Frommann in 1866, and others after him, especially in corpuscles of the connective tissue of the nerve centers and in so-called ganglion cells of the spinal cord. Heitzmann claimed that the filaments visible in the nucleus, its inclosing shell, and the filaments in the mass of protoplasm, are formations of living matter proper, whereas the meshes of the reticulum, and the interstices between the filaments, are filled with a fluid non-living substance. He based his assertions upon the direct observation of the fact that during the motion of the protoplasmic lump the reticulum is in constant motion, and keeps changing its shape so long as the whole lump exhibits signs of life. Later observers, Strassburger, Butschli, Auerbach, Hertwig, Fleming, Klein, and a score of others, have demonstrated the presence of a filamentous structure in the nucleus, which is distinctly reticular only in the condition of rest. Most of these observers resorted to alcohol treatment, and staining methods which cleared up the bulky filaments of the nucleus only; hence a direct connection of the nuclear filaments with those of the protoplasm proper was rendered invisible and even denied. That much, however, was made clear by these researches, that in the nucleus there is a substance capable of form-changes, of growth and of division, properties, therefore, which we are accustomed to consider as attributes of life, or properly speaking, of living matter.

Beautiful, odd configurations of the filaments in the nuclei were described, especially in the process of its division; they present a star, or sun-rays-like appearance, and were given by Fleming the not very musical sounding name of "Karyokinesis." Heitzmann's assertion that the protoplasm likewise, at a certain stage of development, has a distinct reticular structure, is at present acknowledged as correct by many eminent histologists abroad, though the significance of this reticulum, and its participation in the process of motion and locomotion is still a much vexed question. According to these latest views the tissues of the body are not composed of single cells, and

an intervening, intercellular substance, but all tissues form a continuous mass of living matter, which is arranged in the shape of a reticulum throughout the whole body. What formerly were thought to be individual and isolated cells, for instance cartilage corpuscles, bone corpuscles, etc., are, according to his views, points of intersection of the reticulum of living matter, the meshes of which contain a liquid in the so-called cells, and a comparatively solid glue-yielding basis-substance in the basis-substance between the cells. Epithelia also were shown to be connected into a continuous mass of living matter by means of the so-called "thorns" or "prickles" traversing the horny cement substance between the epithelia. The same uninterrupted connection of the living matter has been demonstrated in muscle and nerve tissue. All these tissues being supplied with, and accompanied by connective tissue, the carrier of blood and lymph vessels. They contain isolated corpuscles, called blood and lymph corpuscles, suspended in a liquid, the plasma of the blood and lymph.

This doctrine does away with the previous cellular views and "cellular pathology." Whereas in the former cellular doctrine the animal body was composed of a large number of individual cells, resembling a rather complicated mosaic, in the present view or views of Heitzmann, the body *in toto* is an individual, and the tissues nowhere contain isolated individuals except in the blood and lymph vessels. These views of Heitzmann have largely gained ground here in America, during the last nine years, while abroad many microscopists are rather loath in accepting a doctrine directly opposed to the cell theory. Among the most prominent microscopists in Europe who agree with these new views may be mentioned S. Stricker, of Vienna, and A. Spina, of Prague. The former demonstrated the life of the basis-substance in inflamed tissues, the latter in normal tissues of different descriptions by direct observation under the microscope.

L. Ranvier, of Paris, has recently succeeded in demonstrating the filamentous connections of the epithelia by means of new methods, to a degree of clearness which leaves no further doubt.

Thus I have traced out the development of biological doctrines from the ancient to our modern times.

The progress made in histology has been unquestionably connected with the development of our optical means, and so far as these means have reached a high degree of perfection, so the conclusions reached in the study of histology have become more perfect and satisfactory.

I am personally convinced of the correctness of the views

announced and held by C. Heitzmann, of New York. The reticular connection I have shown in my publications on topics concerning the physiology and pathology of human teeth. Let us hope that with an advancing improvement of the optical apparatus and thorough education, this new doctrine will conquer; for with the cell theory neither the structure nor the pathology of the tissues could be explained to a full satisfaction.

Stricker himself has announced his conviction "that within the next ten years the new views are bound to replace the old-fashioned cell doctrine."

ORAL HYGIENE.

BY MEYER L. RHEIN, M. D., D. D. S., NEW YORK.

[Read before the First District Dental Society of State of New York, May 6, 1884.

This evening I propose to say a few words not concerning some new disease or remedy, but rather to illustrate and enforce that old adage, "an ounce of prevention is worth a pound of cure," in its application to ORAL HYGIENE, the subject to which I desire to call your attention.

The greatest difficulty is that we consider this a hackneyed subject, and feel that every one understands all about it. I grant you that we all have very fair views as to the manner of maintaining the sanitary relations of the component parts of the oral cavity, but do the public at large understand any of the principles of oral hygiene? Aye, I may even ask how many of our patients have well defined ideas as to how the healthy condition of their mouth is to be maintained. Those few who have any knowledge on this subject are only notable examples of exceptions to the rule.

This subject, commonly considered so simple as to deserve only a passing notice, assumes, in my eyes, a position of vital importanee; and the frequency with which it has been considered in other societies during the past year indicates that we are at least awakening to the value of prophylaxis in our department of medicine, with the full hope and expectation of avoiding many dreaded diseased conditions.

ORAL HYGIENE may be summed up in one word, *cleanliness*. Keep the mouth in a perfectly clean condition, and the number of those terrible diseases would decrease; maintain the normal condition of the secretions, and the number would be still further reduced. How much rarer the cases of pyorrhœa alveolaris and pericementitis we

would meet if people would keep their teeth as clean as their faces! How rare would be the cases of exposed pulp if food was never permitted to ferment between the teeth! I shall not, however, consume time by repeating all the evils that can be either prevented or at least alleviated by this seemingly simple prescription. To keep the teeth clean sounds like such a simple thing that it often deceives doctors as well as patients.

When we consider the close juxtaposition of the teeth to each other, ofttimes the irregular position they assume in the arch and, most important of all, the frequency of taking food or other articles into the mouth which may become lodged around the teeth, and the resulting fermentation proceeding upon its work of destruction—then we see that the rule is not so *very* easy to follow, and sooner or later the patient must have his prescription amended, to read, ***Keep your teeth as clean as possible.***

It is our duty, then, to take some of our valuable time and show people by careful manipulation, how very little they know about this sanitary measure. How many of us do this, and if we do it for some patients, why do we not the same duty for all who intrust themselves to our care? Too often, in the hurry and strife of our daily life, do we neglect this all-important duty. The principal article necessary, and the one for which we have not yet discovered a substitute, is the tooth brush.

At a discussion of this subject before the Odontological Society last October, one of the members said (*Dental Cosmos*): "Everybody knows more or less about brushing the teeth; every person understands it; it is an established thing, like washing your face and brushing your hair." My experience, and it has been substantiated by that of much older men, is, that however established may be the practice, everybody knows *less* about brushing the teeth correctly and *more* about brushing them improperly.

Upon making a careful and extensive examination of the brushes retailed in the largest stores in New York city, a feeling of dismay came over me at the ignorance displayed by the general public in their choice of this most necessary adjunct to the paraphernalia of the toilet. Wherever I asked which was the most popular brush, I was shown brushes of such huge dimensions that, before they were shown to me, I supposed they were intended for cleaning the hands and nails. Some of you may doubt this, but you only have to go, ascertain and be convinced. One of this class of brushes is "Dr.

Scott's Electric Tooth Brush," the dimensions of which are simply immense. The cross motion is the only one that can be made with a brush of such magnitude. To quote from Dr. Abbott on this subject: "The consequence is, the gums are irritated and recede, the necks of the teeth become cut or grooved, and sometimes even the enamel is brushed off; besides, when the brush gets half way back in the mouth, its excessive size prevents it from going further, and the back molars are not touched at all."

So the first thing necessary is to prescribe a ***suitable*** brush for your patient. Concerning this, I will speak later; but supposing we have the proper brush, it should be passed in every direction across the grinding surfaces or crowns of the teeth to insure the bristles reaching every depressed surface or fissure, and upon the inside and outside of the arches, passing it in the direction of the length of the teeth from the gum toward their cutting edges, by slightly turning the hand upon the wrist so as to cause the brush to move from ***side to side***. The necessity of brushing behind the wisdom teeth and the insides of all the teeth should be given careful attention. The brushing should never be severe, but always a delicate operation—to merely remove the effete material of a few hours' standing. The dentifrice used should be of the finest quality, so as to produce the least possible amount of friction. The time to brush the teeth is after every meal and before retiring, so as to always leave a clean and polished surface, with no opportunity for fermentation to be instituted in food entrapped between or around the teeth during each meal.

To remove what remains between the teeth after the brushing, nothing surpasses the waxed dental floss, and occasionally a little powder can be carried on it between the teeth. If these directions are followed out to the letter, the patient is keeping himself from many hours of dental torment under our hands.

Of course, there are a large number of patients, business men more especially, who will not follow our instructions very closely. My motto in such cases is, "A half loaf is better than none." If they will not cleanse them after the noon meal, why, insist on their attention to this matter subsequent to breakfast and the evening meal. Nothing is more instructive to the patient than for the dentist, having first handed him a hand-mirror, to carefully brush the patient's teeth for him, explaining at each change of position the method and direction in which the force is applied.

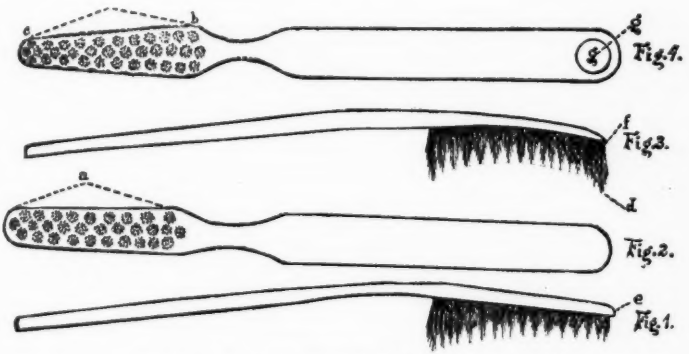
One of the most difficult things of accomplishment for the human

race is the formation either of a new habit or the breaking of an old one. It is for this reason that the inculcation on the mind of a child of this practice of cleanliness cannot be commenced too early. As soon as their first teeth appear, make the cleansing thereof part of their regularly recurring duties. They will soon grow to like it, and will be proportionately uncomfortable until it has received attention; and thus, when the child is still very young, a habit of the greatest benefit is being formed—one which will grow firmer as the child grows older, and prove a boon and blessing to them in later life.

For a long time I sought in vain for a tooth brush that came up to my ideas on this subject. In turn, I discarded the Windsor and Palmer brushes. About this time, Dr. T. J. Thomas, of Paris, presented me with a few of the style of brushes he had been using. They suited me better than any I had yet met, and I concluded that, with certain modifications and improvements, it could be transformed into *the model tooth brush.* In setting out to improve the brush, three facts were impressed upon me:

First, A brush that would reach every exposed portion of the teeth, in small mouths as well as large ones.

Second, One that would accomplish its work as automatically as possible.



Figs. 1 and 2. Brush received from Dr. T. J. Thomas.
Figs. 3 and 4. The Prophylactic Tooth Brush.

Third, If possible, construct the brush so as to prevent the patient's passing it across the teeth.

The brush that has been evolved from these three principles I have named THE PROPHYLACTIC TOOTH BRUSH. (Figs. 3 and 4.) The

slab of bone is curved, with the bristles on the concave side. On the brush, as presented by Dr. Thomas (Figs. 1 and 2), the bristles were divided into three rows, running in parallel lines to the end of the brush. They are widely separated and trimmed to different lengths, to pass as far as practicable between the teeth. The bristles were very high next to the handle and gradually decreased in size, until at the end they were very short. The head of the brush was one-half inch wide at any point (Fig. 2, a). My first step was to give the brush a decided taper, so that while the bone next to the handle was one-half inch wide (Fig. 4, b), at the apex it was less than one-fourth inch in width (Fig. 4, c), and the bristles at the apex are not more than one-eighth inch wide (Fig. 3, d.) The next step was to change the concavity of the bristles. Instead of having them very short at the apex, after passing the center of the brush, the bristles commence to rise in height, and at the apex there are three converging rows of bristles forming one narrow tuft (Fig. 3, d). The trimming and separation of the bristles were left the same.

On the original lot of brushes, and on every brush that I have ever seen, the bristles are set back some distance from the end of the brush, leaving a projecting piece of bone from one-sixteenth to one-eighth inch in length (Fig. 1, e). In a great many mouths this portion of bone prevents the proper brushing of the wisdom teeth, as in attempting to cleanse them it is poked into the soft parts of the mouth. In my brush, this protruding portion of bone terminates close to the bristles (Fig. 3, f), the apex at the back being beveled off, so that the brush passes with the greatest ease around all portions of the wisdom teeth, even in the smallest mouths.

Another improvement in the brush consists in an aperture near the end of the handle large enough to pass over an ordinary tack (Fig. 4, g). The idea of drilling a small hole in the handle of a brush and passing a string through it was one I received from Dr. F. M. Odell some years ago, but the enlarging of the aperture so as to do away with the string is a considerable improvement. The advantages to be derived from hanging up a brush after using, are a more speedy drying of the bristles and additional ventilation, and consequently the brush remains much sweeter and cleaner than by a number of other methods.

Each brush comes enclosed in an envelope, upon which are printed directions for the intelligent use thereof, and the following caution: "Never pass the brush ACROSS the teeth, as this movement destroys

the delicate membrane which attaches the gum to the teeth, causing recession of the gum, and ultimate loosening and loss of the teeth."

The brush has been used by a number of our best known dentists in New York, Philadelphia, Chicago and Boston during the past few weeks, and it has received the heartiest endorsement of all of them.

Having reached the conclusion that THE PROPHYLACTIC TOOTH BRUSH comes nearer to the general approval of the profession than any other brush, I determined to present the brush to the general public through the regular channels of trade, not as Dr. Rhein's brush, but merely as THE PROPHYLACTIC TOOTH BRUSH. For some time the question of professional dignity harassed me, and I was averse to entering into any commercial relations; but a careful consideration of the premises showed me that the fact of my presenting this article to the public need bear no relations to my professional calling. Public hygiene has been a factor of discussion in every medical society, and for the same reason I deem the subject of ***dental hygiene*** as relating to the ***general public*** a fit subject for us to consider. Any efforts that we make for improving the general sanitary condition of mouths, and for instilling some useful knowledge on this subject will certainly tend to nothing less than the elevation of our professional standing.

A HISTORY OF DENTISTRY.

BY GEORGE H. PERINE, D. D. S., NEW YORK.

[Continued from page 216.]

It is estimated that in 1830 the number of dentists in the United States had increased to about 300, and the advancement in every department of the specialty was marked. The number and utility of instruments were much augmented, and changes for the better were constantly being made in general practice. The importance of diffusing information to the people regarding the care of their teeth was at length realized, and consequently the number of popular professional treatises multiplied rapidly. Physicians began to decline undertaking dental operations, referring patients to those making dentistry a specialty. The establishment of tutorships and dental chairs in medical colleges became a subject which engaged the attention of many leading practitioners. Dr. Gardette was a strong advocate of this movement, in which he was seconded by Drs. Hayden, Hudson, Trenor and others, the former having delivered lectures on

dental surgery in the University of Maryland, and the latter having exerted himself to induce the faculty of colleges throughout the country to create dental professorships. Dr. John Harris, in 1835, 1836, delivered a course of dental lectures before the medical department of the Transylvania University of Kentucky; and about 1845 Dr. John S. Clark delivered a course of lectures on dentistry in the St. Louis Medical college, and a few years later Dr. B. Wood received an appointment to the dental tutorship in the University of Tennessee. In 1851, 1852, Dr. C. C. Allen, of New York, who was greatly in favor of the appointment of dental chairs in medical colleges, delivered a course of lectures in the New York Medical College. There were many members of the medical profession who were disinclined to view dental surgery in any other light than an important branch of the healing art, while others, and the number was by no means small, insisted that it constituted a distinct profession in itself, and the establishment, in 1839, of "The American Journal of Dental Science," the first publication ever devoted to and dealing solely with the interests of the dental specialty, and in the procuring, the same year, of a charter for the establishment of, in Baltimore, the first dental college in the world, brought all controversy upon the subject for a time to a close; for from that date dentistry was by the majority considered a distinct profession, while by some it still continued to be regarded as a wayward and wilful child who, by its own heedless act, had severed all connection from the mother whose offspring it undeniably is. Since the year 1839 there have been published in the United States 44 dental journals, and at the present time there are in existence 21, distributed as follows: In the State of New York, four; Pennsylvania, three; Illinois, two; Georgia, two; Ohio, two; and in Massachusetts, Indiana, Missouri, Tennessee, Delaware, California, Wisconsin and Texas, one respectively. To the thoughtful reader, the benefit which these numerous publications bestow upon the dental specialty must be unmistakable. Diffusing as they do the results of manifold experiments, and the fruits of professional study and labor, their presence in operating room and laboratory becomes almost, if not absolutely, imperative; and it is but just that every worker and experimenter should make known, through contributions to their pages, the results attending his labors, that the work of improvement which has brought the science to a state of comparative perfection may continue. To the dental societies which have been organized in this country much credit is due for many improve-

ments, and the increase of advanced ideas; indeed, it would be almost an impossibility for us to estimate the value of their labors. In the year 1841, the first dental society ever organized in the world was founded in New York, and was known as "The American Society of Dental Surgeons." "The American Journal of Dental Science" soon became the property of this organization, when its name was changed to the "American Journal and Library of Dental Science."

The next society which came into existence was "The Virginia Society of Surgeon Dentists," which was organized in 1842. In 1845, it obtained its charter; hence, it claims our respect as being the first regularly incorporated dental society in the world.

Between the years 1842 and 1884 there has been organized in the United States one hundred and three dental societies, and in Canada two; and a large number of these associations are still in existence, and doing much toward the advancement of science, and several of them have been regularly incorporated. Since the founding of the Baltimore College of Dental Surgery, to which we have alluded, other dental colleges have come into existence and been regularly chartered. They were as follows: In Kentucky, one; Ohio, one; New York, two; Pennsylvania, three; Missouri, two; Louisiana, one; Massachusetts, two; Indiana, one; Illinois, one; and California, one. A dental department has been connected with Harvard College, the University of Michigan, the Pennsylvania University, the University of Tennessee, the Vanderbilt University, and the University of California. A dental surgeon was in 1862 appointed to Girard College in Philadelphia; and, in addition to the above, the following institutions have established dental tutorships: The Iowa State University; the Kansas City Medical College; the Rush Medical College, Chicago; the Albany Medical College, and the Syracuse Medical College.

The first dental infirmary in the United States was established by the Society of Dental Surgery of the State of New York, in 1847. This infirmary was open each Saturday for clinical operations, which were made for the benefit of the inmates of charitable institutions and other worthy indigent persons. Members of the State Society and their students were entitled to all the benefits of practice and observation the institution afforded.

In 1861, a dental hospital was connected with the Charity Hospital of Philadelphia, this being the first hospital of the character founded in this country.

In 1867, the Brooklyn Dental Infirmary was established under the auspices of the Brooklyn Dental Society, and was voted by the city an annuity of $1,500.

The Massachusetts General Hospital, in 1872, established the office of "Dentist of the Hospital." So great has been the demand upon the dental department of this institution that several thousand patients are treated there annually. Notwithstanding that the advance in dental science in this company has been rapid, there has not been on the part of the faculty, it would appear, a sufficient interest taken in hospital service. In other words, the improvement in hospital attendance has not kept pace with those made in other directions, else the medical and surgical staff of all hospitals in large cities would include a competent dental practitioner by whom patients suffering from diseases of the oral cavity would be placed.

St. Luke's, the Woman's, the German and Manhattan Hospitals, the Columbia Institute of New York have each a dentist included in their medical staff.

From the foregoing, the reader will be enabled to form a fair idea of the advance made by the specialty within a comparatively brief period. A step of great importance, and by which the specialty considerably elevated from its previous standard, was the enactment in most of the States of a law to insure the better education of the practitioners of dental surgery, and to regulate the general practice of the specialty. The State of Alabama was the first to set a worthy example by the passage, in 1841, of a Dental Act, which was followed by New York, Ohio, Indiana, Kentucky, Louisiana, Georgia, North Carolina, South Carolina, West Virginia, Pennsylvania, New Hampshire, New Jersey, Illinois, and California; and it is likely that ere long every State in the Union will take legislative steps to regulate the practice of dentistry. Canada has also passed an Act regulating the practice of the specialty in the Provinces. In the States of New York and Georgia dental practitioners are by law exempt from jury duty. The result of such legislation as we have alluded to must be obvious to the reader. Irregular practitioners were in a great measure restrained, and those entering the profession are compelled to acquaint themselves thoroughly with all of its branches and requirements.

A subject which has been more or less agitated since 1840, or thereabout, and one which is intended to benefit a vast number of persons in the service of our government, is the question of dental

appointments in the army and navy. In 1859, through the efforts of Dr. E. Maynard and others, the President and Cabinet became so much interested in the subject that there was at one time every appearance of the matter assuming a substantial issue. The secretaries of war and of the navy also viewed the subject favorably but, owing doubtless to the pressure of other business, no official action was taken.

In 1861, the American Dental Convention appointed a committee to bring the subject again forward. The Surgeon General was conferred with, and by him the matter was recommended in his report, but it was not until 1868 that a bill was drafted, recommending the appointment of dentists in the army and navy, which was presented before Congress, by which body it was referred to the committee on military and naval affairs, by whom no action was, however, taken.

Again, in 1874, a second bill was brought before the House, advocating dental appointments, which was also referred to the committee, as before, who failed, however, to bestow upon it the attention one of such importance deserved. A dentist has been appointed to the United States Naval Academy with the rank of assistant surgeon.

During the progress of the late unhappy war, there arose in the Southern States a discussion as to whether dentists were, as physicians, exempted from the army, when it was decided that they were subject to conscription. Surgeon-General Moore immediately made application to the Bureau of Conscription for the detail of dentists for duty in the hospitals, and, after some months of experiment, he caused to be issued the following order:

OFFICE OF THE MEDICAL DIRECTOR C. S. HOSPITAL IN VIRGINIA.
Richmond, Va., Nov. 4, 1864.

CIRCULAR NO. 15.

I. As far as practicable in future, the operations of dentistry required in General Hospitals in Virginia, will be performed by Officers, Soldiers, or Conscripts assigned to those duties, who are dentists by profession.

II. Examinations will be made, at such times as may be fixed by the surgeon in charge, of each officer and soldier, admitted into hospitals, and the necessary operations performed with the concurrence of the attending Medical Officer.

III. Dentists are expected to be provided with their own instruments, but the necessary materials and files will be purchased with

the Hospital funds, and requisition made for other instruments thought necessary.

IV. Dentists will have the rank, pay and perquisites to which their position in the army entitles them, and, in addition, such extra duty pay for extraordinary skill and industry, as the Surgeon-General will allow, in accordance with general order No. 66 A. & I. G. office, current series.

V. Monthly reports of dental operations and accompanying registers, in accordance with forms furnished, will be forwarded through the Surgeon in charge, and through this officer to the Surgeon-General by the fifth of the month succeeding.

(Signed.) WM. A. CARRINGTON,
Medical Director of Gen. Hospitals in Virginia.

WAR DEPARTMENT, SURGEON GENERAL'S OFFICE,
Richmond, February 6, 1865.

To Medical Directors of Hospitals:

I. Medical Directors of Hospitals will without delay, select a thoroughly lighted ward (gas-lighted if practicable) in some one of the Hospitals under their jurisdiction, to which will be sent for treatment, by Bean's apparatus, all cases of fracture of the superior and inferior maxillary bones now in Hospital, or that may hereafter be admitted.

II. In the construction, adjustment and use of this apparatus the attending Surgeon will be aided by the Dentist assigned as such to the Hospital selected.

Any article, not on the Supply Table, necessary for the treatment of such cases may be purchased by the Hospital fund.

The ward selected being reported to this office, the inventor will visit the Hospital to confer with the authorities on the preparation, adjustment and use of the apparatus.

Medical Examining Boards will not grant furloughs in such cases until the fractures are completely united.

SAMUEL PRESTON MOORE,
Surgeon-General C. S. A.

Official: S. H. STOUT, Medical Director.

Under another order from the Surgeon-General's Department Dental Surgeons were required to make monthly reports to the Medical Director, and separately for each Hospital, the number and character of each surgical operation performed during the month.

CORRESPONDENCE.

Editor New England Journal of Dentistry:

Herewith I hand you copy Constitution and By-Laws of the Dentists' Benevolent Association; also report of last annual meeting, held at Sweet Springs, Mo., July 10, 1884. This Association, as you are aware, was first organized under the name of "The Dentists' Mutual Benefit Association," but for several reasons the name was subsequently changed to that which it now bears. The projectors have made no decided efforts heretofore to bring it to the general notice of the profession, preferring to wait until such time as they felt it was on a basis sufficiently sound and reliable to insure future success. This they are now quite sure has been accomplished, and with that feeling they wish, through the medium of the dental journals, to present its claims to those most directly interested, and ask at their hands the recognition and encouragement its objects entitle it to. It had its origin through a discussion of "The Marshall H. Webb Fund," and those most active in its inauguration were prompted by no motive other than the formation of systematic plans to meet the requirements in similar cases in such a manner that the burdens of contribution would be more equally distributed, and the families of such men aided in a way that would not leave them in the light of mendicants. After a thorough canvass of several different plans, those which they now present were deemed the most feasible, for the time being, at least. If in the future its membership should be so aggregated as to give it proportions of more general and widespread interest, then such changes and improvements as seem indicated can be made. It is duly authorized by charter to carry out the objects of its organization, and its officers and members are thus far all responsible and well-known men, and we trust that their names are a sufficient guarantee of its reliability. Thus far the few of us who have been most active in the movement have given our time and money without hope of fee or reward other than the satisfaction of having laid the foundation for good to our fellow man and dentist. This we expect to continue in the future until such time as the duties become such as to demand remuneration for their perfect performance. By this means, its operation is rendered comparatively inexpensive, a feature which gives it advantages superior to that of any similar organization in existence. If not inconsistent with your views, we would ask that

you give accompanying report space in your JOURNAL, together with such editorial mention and endorsement as you feel justified in giving.

Respectfully,

R. I. PEARSON, *Secretary*.

DENTISTS' BENEVOLENT ASSOCIATION.

The first annual meeting of the above organization was held at Sweet Springs, Mo., July 10, 1884, President C. H. Darby in the chair. About twenty-five members were in attendance.

The annual report of the Secretary and Treasurer received and approved.

The following officers were elected for the ensuing year:

President—Dr. C. H. Darby, St. Joseph, Mo.

Vice-Presidents—Drs. F. Swap, Booneville, Mo; Dr. J. J. R. Patrick, Belleville, Ill.; W. H. Eames, St. Louis, Mo.; R. E. Nickles, Salina, Kan.; J. W. Reed, Battle City, Montana Ty.; Mr. F. X. Combs, Chicago, Ill.

Secretary and Treasurer—Dr. R. I. Pearson, Kansas City, Mo.

Board of Directors—Drs. A. H. Thompson, Topeka, Kan.; J. A. Price, Weston, Mo.; J. M. Austin, St. Joseph, Mo.; George H. Cushing, Chicago, Ill.; G. W. Tindall, C. B. Hewitt, J. B. Patterson, H. S. Thompson, A. C. Schell, J. S. Letord, Kansas City.

This Association is now in practical working order and is duly authorized by charter from the State of Missouri to carry out the objects of its organization. Composed exclusively of persons identified with the dental profession, and having no salaried officers or other excessive expenses, it offers to those eligible to its benefits a cheap and reliable means of providing for their families in case of death. For further information, address

R. I. PEARSON, *Secretary*,
2206 Troost Ave., Kansas City, Mo.

Sept. 1, 1884.

We have heretofore referred to the above Association, and commended it to the notice and encouragement of the profession. The "ball is now in motion," and there is ample material in America for a large and prosperous association of this kind among dentists. Let all who are interested write to the Secretary for a copy of the Constitution and By-laws. We are satisfied that it is an association worthy of support and for the interest of the profession.—[ED.

OUR NEW YORK LETTER.

All dentists will be interested to learn of the important decision rendered Sept. 17, in the New York Circuit Court, concerning the so-called Richmond patents.

The "International Tooth Crown Co." applied for an injunction restraining Berkowitz and Muller from using the methods covered by the C. M. Richmond "Tooth Crown," the Low "bridge" patent, and the A. S. Richmond "bridge" patent.

The defendants were formerly students in the office of the "International Co.," and when they began private practice purchased one year licenses of the Company to use the methods in question. These licenses having expired, the Company for some reason refused to renew them and prayed the Court for an injunction when learning that Berkowitz and Muller were still crowning roots.

The importance of these proceedings to the profession was very great, as in one sense they constituted a test case and made every dentist in the United States a defendant. Fortunately, the profession was alive to the danger, and turned out in force to oppose the application, represented by that celebrated patent lawyer, Mr. S. J. Gordon. Fortunately, too, the case came before Judge Wallace, who recently decided that patents proved to have been procured by fraudulent representations could be invalidated under the new national law which relates to the forfeiture of land grants obtained through fraud.

The testimony of Dr. A. S. Richmond concerning the fraudulent representations used in procuring the patents, and the expert testimony of Drs. Dwinelle, Northrop and Kingsley, upon the extent of the dental art and the almost universal use of the principles in question for years before the patents were issued, caused Judge Wallace to refuse the injunction and to invalidate the C. M. Richmond "tooth crown" patent, and the Low "bridge" patent—which bridges from an attachment to *one* root by the use of a Richmond Crown or Cap.

Decision was reserved concerning the A. S. Richmond "bridge" patent, which covers the process of attaching porcelain teeth to a bridge fastened to *two* roots by the use of Richmond Crowns, one at each end of the bridge.

A desperate attempt is to be made by the "International Co." to sustain this patent, for it is the only one of any consequence left them, and any dentist who used the method before August, 1882, can materially aid in having the patent set aside by sending his

address to S. J. Gordon, Esq., 44 East Fourteenth St., New York city.

One clause in the licenses signed by the defendants, Berkowitz and Muller, stipulated that they should never contest the validity of the patents or engage in any suit concerning them against the "International Co.," even if that Company should refuse at any time to renew the licenses. Therefore, the plaintiffs claimed that this clause in the licenses debarred the defendants from defending themselves against the desired injunction, and Judge Wallace reserved his decision upon this question, intimating, however, that he would not enjoin parties under patents which he had invalidated because of proof concerning their fraudulent creation.

The profession certainly owes much to its "Protective Association,"—at the head of which is that war-horse in every good cause, Dr. W. H. Dwinelle—for the thoroughness of their work in this matter; and enough in praise cannot be said concerning the kind and patient interest taken in the case by Mr. Gordon, who has given it the benefit of his skill and great legal experience, and as yet without the deserved remuneration.

Those who attended the March meeting of the First District Dental Society will remember the interesting statement made there by Mr. Gordon in regard to these patents, and what he thought could be done if the dentists should try to have them invalidated. He has now fulfilled his prophesy!

D.

Books and Pamphlets.

Formation of Poisons by Micro-Organisms: A Biological Study of the Germ Theory of Disease. By G. V. Black, M. D., D. D. S. P. Blakiston, Son & Co., 1012 Walnut Street., Philadelphia. Price, $1.50.

A volume of about 180 pages, faultlessly printed and bound, supplying a want that has, for some time, been apparent. It consists of a series of lectures, "delivered before the students of the Chicago College of Dental Surgery and a number of practitioners who were ticketed especially for this course."

The first three lectures—part first—give a brief *historical* study of the Germ theory of disease, divided under the following heads,

namely: *Introduction—First Traces—Incentives to the Study—First Definite Announcement—Phlogiston—Zymosis—Jenner—Nineteenth Century—Early Discoveries—Schwan—Effects of Schwan's Discoveries—Liebig's Opposition—Difficulties—Schroeder—Pasteur—Bastian—Logical Sequence—Difficulties—Modes of Propagation—Utilizing Discoveries—Explanatory—Nature of the Evidence—Direct Examination—Hirschfield—Evidence Unsatisfactory—Nature of Miasm and Contagion—Miasmatic Contagion—Infection Experiments—Thiersch—Lister—Dr. Salman—Billroth—Virchow—Prof. Klebs, of Prague—Volkman—Lister's Reply—Beale—Bacillus Anthrax—Koch—Results—The Evidence—Spores,–Habits—Summing up.*

The subject of the four following lectures—part second—is: "The Relation of Micro-Organisms to the Production of Disease," under the following headings, *Necessity for a Physiological Study of the Subject—Digestion—Propositions—Ferments—Plants—Sprouting of Seeds—Nutrition—Yeast Plant—Cellular Digestion in the Higher Animals—Resorptive Digestion—Digestion of Blood Clot—Digestion of Ligatures—Digestion of Sponge—Necrosed Bone—Action of Tissues—Soluble Ferments—Pathological Formation of Ferments—Parasites—Waste Products, considered with Reference to the Germ Theory of Disease—Waste Products of Plants—Alkaloids—Bacteria—Tabulated Statement of the Waste Products of Various Organisms—Poisons—Farther Investigation Needed—Physiological Changes—Manner of Action—Inflammations and Blood Diseases.*

Then follows an Appendix on "*Dental Caries: Its Relations to the Germ Theory of Disease.*"

The above, together with Dr. Black's well known ability to deal with such subjects, is sufficient to excite a general interest in, and a demand for, the book.

The portions of this work that seem to us of *chief* interest at the present time is indicated by the following quotation. After reviewing the *history* of the Germ theory—which is concise and of much value to the ordinary reader—the author says: "It will be seen by any one who reviews this whole subject closely that, while the experimentation that has been had furnishes the strongest evidence that disease results from the presence of micro organisms (is brought about in some way through the life and growth of these lowly forms), the *modus operandi* by which they induce disease has not been explained, or such explanation has been but partial." . . . . The Germ

theory of disease, as it stands to-day, is essentially a mass of unexplained facts, developed by direct experiment of the most subtle nature; so subtle, indeed, that there are but few men who have the natural endowments and rigid training necessary to verify them in a manner, and with the certainty, that the thought of the times demands.

Under these circumstances, and with the plain fact before us that the mere presence of the organisms is not a sufficient cause of the diseases that experiment teaches us are induced by them, we naturally turn to the well demonstrated fact that micro-organisms do give rise to poisons, for an explanation of these phenomena. It is our purpose now to make an effort to trace certain of the phenomena presented by the life force in its relations to matter, with the end in view of elucidating this difficult point. In this direction, as it seems to me, we are most likely to find a satisfactory explanation for some of the teachings of experiment that have seemed difficult to understand."

No one who is at all conversant with the present standing of the Germ Theory of Disease can fail to be deeply interested in the question; of: "How can these low organisms produce disease"? What is the modus operandi by which they produce the results growing out of their presence and activity? So far investigators throw but little light on these questions. The answer will probably have to be given by others than those who are giving us the facts discovered along the line of their special investigations. Dr. Black, at least, gives us much to think of in relation to an answer to these questions. That he has found the true answer, that his theories will not be modified, it is hardly reasonable to expect; but that he has "opened up the right vein" seems perfectly clear. At the risk of misleading, but for the purpose of exciting an interest in the Doctor's full explanation, we quote the following: "To say that these organisms produce disease, simply by their presence, is not a sufficient explanation. We all know that their presence is not, in itself, a sufficient cause; for if this were so, one organism would be as potent as another. And we all know, who have had any experience in the examination of these forms, that many of them are without any evil effect whatever; that wounds in the mouth and elsewhere heal readily and perfectly when covered with them. We also know that a great majority of the higher plants are innocent of any evil effect upon the human system; and it is perfectly reasonable that we should find the same differences to exist

among the lower plants. Many kinds of plants grow together without injury to each other; but plants are found that destroy their neighbors by the poisonous effects of their waste products. Then it seems plain that the differences must be found in the peculiar products to which the peculiar organism gives rise. These we have already sufficiently explained. We have, also, sufficiently explained the modus operandi, in the destruction of organic substances in general. They are simply remoleculized, as any other food material is remoleculized; nothing more and nothing less; and it is in the chemical reorganization of the elements for the formation of the waste products that poisons are evolved.

It seems perfectly natural that in this remoleculization there should often be a residue that escapes digestion; as is seen in the so-called rotting of wood and many other substances. It is not probable that one organism is capable of the complete destruction of such substances; but rather, that many are concerned in the work."

Dr. Black's "remoleculization" appears to be a term substantially equivalent to Pasteur's "disturbance of the normal equilibrium of the tissues;" perhaps, rather, an elaboration of the latter.

In regard to the resistance of tissues to the invasion of organisms Dr. Black thus happily illustrates: "How do they (the tissues) resist? Now, if we accept the explanation of the formation of the digestive bodies, as previously explained, this supposition becomes tenable. When an organism or spore of an organism falls upon a cell or naked granulation of a wound, and finds there the conditions suitable for its development, its digestive body is at once thrown out for the preparation of its food material which exists in the tissues with which it is surrounded. This digestive substance proves irritant to the cell upon which the germ has fallen. This irritation excites the cell to throw out its peculiar digestive body for the removal of the irritant with which it is beset. Here we get a glimpse of the antagonists. It is cell against cell; digestive body against digestive body. A contest has begun. Which will win? The stronger, of course. If the man be vigorous and healthy and his tissues highly endowed with the energies of life, the chances are this much in his favor; but if, on the other hand, his powers of life be at a low ebb, if his tissues respond to the irritants but feebly, then the chances are, this far, in the favor of the intruding organism. . . . . Surely, if the tissues are capable of forming, by reason of irritation, a secretion that will digest a piece of ivory that has been thrust into the flesh, which has been

proven by direct experiment, we should expect this kind of resistance to be offered to the development of disease-producing germs." We might go on quoting at very great length did our space admit, for the book is full of good things, but our purpose was simply to indicate, to some extent, the line of thought of this extremely interesting and instructive little treatise on an extremely interesting subject.

Of Dr. Black's treatment of the Germ Theory as related to dental caries we have the space to but briefly notice. He, in a condensed form, reviews the history of the various theories heretofore held, giving prominence to the acid theory, and showing how "the old acid theory glides easily into the new germ theory." Here he ingeniously introduces the theory of soluble ferments or organic digestive fluids, depending upon neither acidity or alkalinity for their action. His accounting for the "widening of the tubules" is of special interest at the present state of discussion. Dr. Miller seems to account for this phenomena by the simple action of lactic acids, derived from the fermentation of the starch and sugar of food substances and the saliva: an *outside* source. Dr. Black states that the "widening of the tubules is a conceded fact. It is also shown that it is not done by the lactic acid in cases of other experiments; nor can it be done by the physical force of the organisms; but it can, in all probability, be done by the digestive fluid of the organism. The conditions for this work of the digestive fluids is the same as that of the granulations in widening the meshes of the sponge and finally removing the last of it." Dr. Black's position in regard to the action of micro-organisms in dental caries is—it would seem—more in accord with Underwood's theory than that of Miller's. The digestive fluid, or toxic secretions, of the organisms serves to break down the *molecular structure* of the vital *contents* of the tubules first, and afterwards acting upon the *walls* of the tubules, thus widening and enlarging them as is shown to be the fact. Thus the *effect* of the action of organisms may, theoretically at least, be observable in advance of their actual presence. If Dr. Black is correct in this, Dr. Miller's mistake in accounting for his "softened but non-infected territory" may be readily understood. His lactic acid and its origin relates mainly to the "scab" of the sore; the digestive fluids of the organisms produce the sore.

We have been intensely interested in the perusal of this little book because of its recognition and elucidation of the universal law of molecular transformation, or molecular rearrangement. It deserves, and doubtless will have, a wide reading on the part of the profession.

The paltry sum of $1.50 should be considered a small equivalent to offset the information which may be gained by a knowledge of its contents. S.

TRANSACTIONS OF THE ILLINOIS STATE DENTAL SOCIETY FOR 1884.

We always look with eager interest for the annual transactions of this society, and this is in no way disappointing. It is a volume of 170 pages, neatly printed and bound, and, apparently, very faithfully edited. Several of the papers are illustrated by excellent wood cuts. A hasty glance would indicate that the leading papers of general interest were "Reflex Pain," by Kate C. Moody, D. D. S.; "Origin of Defective Enamel," by W. H. Eames, D. D. S.; "Inflammation," by Homer Judd, M. D.; "Dento-Embryonal Histology," by W. X. Sudduth, D. D. S., finely illustrated; "Irregularities in Human Teeth; or, Dental Teratology," by John J. R. Patrick, D. D. S., also profusely illustrated, and "Chemistry," by Wm. H. Taggart, D. D. S.

The discussion following these papers is, generally, excellent, and indicates—what seems to us an excellent plan—that by previous arrangement some one was appointed to *open* the discussion on each paper. Thus, in many instances, virtually two papers were produced on the same subject.

The "Transactions" of this society are very nearly a model and type of what any society may well aspire to reach.

TRANSACTIONS OF THE DENTAL SOCIETY OF THE STATE OF NEW YORK. Sixteenth Annual Meeting, 1884. Committee of Publication: Drs. J. Edw. Line, F. French and W. C. Barrett.

In our June number we alluded to the annual meeting of this society, which was held May 14, 15. The "Transactions" make a very neat volume of over 100 pages, very carefully edited, and in every respect a credit to the society and the profession as well. The committee of publication are to be congratulated upon having so soon completed their work. Unless these reports come somewhere within a reasonable time of the occurrence of the meeting, they lose much of the interest that would otherwise be attached to them.

It is a pity that the "Transactions" of several of these State societies cannot have a wider circulation among the profession. They make excellent material for every dentist to study and file away in his library for future reference.

The VIERTELJAHRESCHRIFT DES VEREINS DEUTSCHER ZAHNKÜNSTLER of August contains a report of the general meeting. This society is quite prosperous, having a surplus of about $300.

The Germans use the French word plombe for cement, which appears to us as very much inferior to the English word.

A new remedy supposed to be superior to ordinary arsenic for killing pulps is proposed, namely, fly poison or fly cobalt, a combination of arsenic and cobalt. We cannot see, a priori, any advantage of a preparation of varying and uncertain composition compared with the white arsenic. With it we always can be sure how much we take.

In another article, the old key for pulling teeth finds a defender.

Dr. Essig's *Dental Metallurgy* is partly translated, and does not lose anything by the translation.

From a little notice, we see that an article about the application of homeopathic drugs in dental surgery has been published. Why not one of Catholic charms, or laying on of hands, or the power of Baal in excavating teeth, or that of the spirits in condensing gold fillings? Homeopathy and dentistry!

TRANSACTIONS OF THE NEW YORK ODONTOLOGICAL SOCIETY FOR 1883. Published by the S. S. White Dental Manufacturing Co., Philadelphia.

The "Transactions" of this society are too well known for merit of a high order to require an extended notice. Any dentist will consider himself fortunate who possesses a copy.

THE ORIGIN OF DEFECTIVE ENAMEL. By Prof. W. H. Eames, with opening discussion by Prof. L. C. Ingersoll. Read before the Illinois State Dental Society, at its Twentieth Annual Meeting, Springfield, Ill., May 13, 1884. Reprint from Transactions of the Society.

A very interesting paper and discussion.

MICROSCOPICAL STUDIES UPON THE ABSORPTION OF THE ROOTS OF TEMPORARY TEETH. Whitney Memorial Prize Essay of the Dental Society of the State of New York, 1884. By Frank Abbott, M. D.

Reprinted from the *Independent Practitioner* of July, 1884.

UNIVERSITY OF PENNSYLVANIA: Catalogue and Announcements for 1884.

EDITORIAL.

THAT OPENING PRAYER.

We have received, since our last issue, several communications relative to the editorial reference it contained to the "opening prayer" at the Saratoga meeting of the American Dental Association.

We hardly need to say that we are not surprised. We did not expect that all would agree with us. We are only surprised that so few have protested against it, and that so many have commended our course. We might well let the matter stand as it is were it not for the fact that a few seem to understand us to attack prayer *per se*, instead of the custom of introducing a prayer on such occasions. If such will read the item carefully they should see their error. We consider a discussion of prayer per se out of place either in a dental *journal* or a dental *convention*. Consequently, we argue against the custom of "opening" dental meetings with prayer, especially a "hired" prayer. But if they are introduced and become a part of the regular proceedings, they may become the subject of criticism as regularly as any other part of the proceedings that come in the regular order.

Now, what are the facts in this case, and what are some of the reasons why this old custom should be omitted? We answer that it is inherently "out of order." This was a meeting of *dentists* organized and banded together for the sole purpose of discussing and advancing the *science of dentistry;* the membership of the society is made up of those who hold to *all* shades and *no* shade of religious belief; there are those who devoutly reverence and observe prayer, and those that indifferently observe it if they observe it at all—together with those who as conscientiously disbelieve in it and honestly look upon prayer as a mere sentimental formality; there are protestants, catholics, jews, atheists and infidels to be numbered in the membership of this and like societies, and all standing upon an equal basis as regards the organic laws and purposes of this society. Those who believe in prayer also believe in different methods and forms of its observance, and to those who do not believe in it it is an impertinence or, at least, uncivil to impose it upon them by the force of a majority vote. Now the protestant and the atheist may regard each other with feelings of commiseration, the catholic and infidel

may earnestly and conscientiously desire to convert each to the other's standpoint of peculiar opinion and belief, but we respectfully submit that they must seek some other opportunity and occasion than the hours of a *dental* meeting in which to exhibit their differences and exert a converting influence each upon the other. There are political as well as religious differences adhered to by the membership of the society, but no one would think for a moment of introducing political questions or statements in any form into a meeting of this kind; and yet we fail to see why one is not just as much inherently out of order as the other.

Then, again, a wise and manly *toleration* demands that the custom be dispensed with. If one class of members have "*tolerated*" the "opening prayer" for so long a time out of a spirit of courtesy and politeness, it does not follow that the other side should not take its turn at courtesy and politeness, at least to the extent of *omitting* a custom that is offensive to some who have equal rights with themselves. Suppose, for instance, that the "infidel" portion of the meeting had called for the reading of a chapter from Payne's "Age of Reason;" would not the presiding officer have ruled it out of order? We knew of just such an instance not long since, and the president very justly ruled it "not in order;" but the reply of the *mover* that "the motion is just as much in order, sir, as that prayer of Dr. ——," which had just been uttered, seemed to express very clearly the universal sentiment of the meeting. The first horse race on Springfield's famous Hampden Park was opened by prayer by the Rev. Henry Ward Beecher, but the custom has been wisely dropped of late years, with no probable detriment to religion. And so we believe that a thoughtful apprehension of the facts in the case will lead those whose regard for prayer is most sacred to agree in dropping it on all such occasions where, at the best, it is little more than a mere formality. To be cast about as a mere formality, out of deference to a polite custom, can only serve to *cheapen* real prayer in the minds of reasonable men. In simple justice, then, to all let the prayer be banished hereafter from the "street corner"—the programme—and remanded to the "closet," in accordance with the wisdom of one of old.

The annual meeting of the Connecticut Valley Dental Society will be held at the Haynes House, Springfield, Mass., Nov. 13 and 14, and will be of special interest.

AN ANNOUNCEMENT.

For some weeks past we have had under consideration an important change in the affairs of this JOURNAL. As a result, we have to announce that this number will close the existence of THE NEW ENGLAND JOURNAL OF DENTISTRY, *per se*. Arrangements are effected by which this JOURNAL and THE ARCHIVES OF DENTISTRY are to consolidate. Several months since "*The Dental Journal Association*" was organized and chartered by leading members of the profession in the West, for the purpose of publishing an independent dental journal. It purchased, as a nucleus, the *Missouri Dental Journal*, and has issued its ninth number under the title of *The Archives of Dentistry*. After mature deliberation, the publishers and editors of the NEW ENGLAND JOURNAL OF DENTISTRY have decided that the interest of the profession may be best served by uniting their forces with this "Association;" and for the purpose of giving our subscribers an opportunity to form the acquaintance of the combined journal, they will be supplied with it for the balance of the year. The Association will have the entire control of the editorial work of the journal, but arrangements have been made with J. H. Chambers & Co., of St. Louis, Chicago and Atlanta, for a term of years, for its publication. The whole country is being organized for editorial work, and no effort will be spared, by editors or publishers, to make the *Archives* a national journal, acceptable in every sense to the profession.

In thus merging ourselves with the *Archives of Dentistry*, we take no backward step; it is, rather, an important step forward, and one that is, in a certain sense, imperative. The NEW ENGLAND JOURNAL OF DENTISTRY was started in a modest way, and with special reference to local interests, as its title implies. On its third issue, however, it became self-supporting, and it has had a steady and sure growth until the present time, when its circulation has vastly overflown the limits of its implied territory. In attempting to adjust ourselves to this new demand upon us, we believe we have effected by this combination the best possible arrangement. We have many thanks to offer the friends of the NEW ENGLAND JOURNAL, and fully believe that in taking this step we are doing that which results will show to have been the wisest. Our advertisers will surely suffer no loss by this arrangement, as the new publishers will fulfill the terms of our contracts in every detail.

Subscribers will be furnished with an index to this volume in due time.

THE NEW ENGLAND DENTAL SOCIETY.

The twenty-second annual meeting of the New England Dental Society was held at Boston on Oct. 2d and 3d. The first day's meetings were held at Hawthorne Hall, Park street, and the second at the Harvard Dental School building on Grove street. Routine business occupied the attention of the society at its first session, during which a large number of new members were admitted. The first paper of the afternoon session was read by Dr. R. R. Andrews, of Cambridge, Mass., on "The Development of the Teeth." This paper was of special interest inasmuch as it was intended by its author to be a demonstration of certain errors set forth in an address that was delivered before this society, on the same subject, at its last meeting, by Prof. Garretson. The exhibit of many splendid diagrams and photographs of his own work in histological research added greatly to the interest and elucidation of the subject. We published last year the address which this antagonizes and shall have the pleasure of soon laying Prof. Andrew's paper before our readers.

Dr. Bödecker, of New York, who was present, stated that he had never seen, in his studies of embryology, what Prof. Garretson announces in connection with this subject. The drawings which Prof. Andrews exhibits before you here are correct according to my own observations. Can indorse everything that Dr. Andrews has alluded to.

The next paper was given by the special guest of the society, Dr. J. F. P. Hodson, of New York; subject, "Crystal Gold." The paper is one of great practical value and was listened to with marked interest. The discussion that followed brought out many valuable points and showed a general interest in the subject, as well as being highly complimentary to Dr. Hodson. The appreciation of Dr. Hodson and his paper, on the part of the society, was manifested by electing him to honorary membership. This paper also we shall publish soon, together with the discussion that followed it.

Dr. How, of Philadelphia, being present, was given time to explain and illustrate his methods of applying the "How Crown."

The evening session was devoted to the Herbst Method of Filling Teeth. A paper was read by Dr. A. M. Dudley, of Salem, Mass. (to be given in our next number), after which Dr. Bödecker, of New York, who had just returned from Europe, where he had spent several days in the office of Mr. Herbst, detailed at great length his own and Mr. Herbst's latest experiments and improvements. The

greatest obstacle to the introduction of this method in this country seems to be the fact that American golds are not adapted to the necessities of this method. At present there is but one manufacturer —Wolrab, of Bremen—who possesses the secret of preparing gold that gives entire satisfaction. The duties on the importation of Wolrab's gold are so high—about 55 per cent.,—that, at present, at least, the method is not likely to become very popular. Dr. Timme, of Hoboken, has, however, a limited supply, and those who may wish to experiment with this new method may obtain it from this source. The S. S. White Dental Manufacturing Co. already have in stock the instruments necessary for its use. Our American manufacturers of gold foil will doubtless succeed in solving the secret of its preparation at no distant date. Dr. Bödecker is quite enthusiastic in his advocacy of this method and deems it of much importance in, at least, very many cases that come into our hands. He considers it to possess an advantage over the old methods in that by it gold may be more perfectly adapted to the walls of the cavity. Much valuable time may be saved thereby, retaining points or pits may be avoided, thus saving the consequent weakening of frail tooth structures, the doing away of the annoyance to the patient of malleting, and because of the fact that so little pressure is needed to consolidate the gold a much frailer tooth may be filled by this than any of the old methods. Dr. Bödecker exhibited many beautiful specimens of gold fillings made by Mr. Herbst, and which he kindly loaned to Dr. Bödecker to be shown to the profession in this country. Many of these were large and difficult cases and were made by this method in a surprisingly short time. In consideration of the professional kindness of Mr. Herbst in thus giving to the profession in America, through Dr. Bödecker, all the information possible regarding his new method, the society unanimously instructed the secretary, Dr. Dudley, to formally communicate to Mr. Herbst its cordial thanks.

The Herbst method, as described by Dr. Bödecker on this occasion, is so concisely and admirably set forth by Dr. W. D. Miller in the October number of the *Independent Practitioner* that we reprint it here. We might almost say that Dr. Bödecker said it. Both are evidently familiar with the methods of Herbst.

"This method is especially characterized by two features. The first of these is the extensive use of the matrix (Dr. Bödecker uses a matrix made from a watch spring), for approximal cavities, the second the employment of a rotating, smooth-pointed instrument for condensing the gold.

The operation may be best made clear by describing a case in practice. We have to fill the left upper bicuspids, both decayed on the approximal surfaces. The cavities are opened to the grinding surface and prepared as for inserting a cohesive foil filling, with exception of retaining points, which are never made. The matrix is now brought into place, and the point of a steel pin inserted between the matrix and first bicuspid from the buccal side, and if necessary from the lingual side also, so as to press the matrix tight against the surface of the second bicuspid at the neck; warmed shellac is now packed into the cavity of the first bicuspid to hold the matrix firmly in position. After the cavity of the second bicuspid has been filled, the shellac and matrix are removed, a second higher (wider) matrix inserted and pressed by the same means as before tight against the surface of the first bicuspid, which is then ready for filling. Should the second bicuspid be wanting, then the matrix is held in position by filling the whole space between the first bicuspid and the first molar with shellac. The matrix being in position, three or four cylinders of Wolrab foil No. 2, 3 or 4 (or an equivalent of Wolrab foil No. 4 made into pellets) are brought into the cavity just as they would be into a simple cavity on the grinding surface, and fixed into position by pressing tightly upon them with one of the larger burnishers of the set, slowly rotating. It is then condensed by a succession of strong taps or pressures of the rapidly rotating instrument, No. 5.

(The surface of the instrument soon becomes coated with gold, which must be removed by pressing it while rotating upon a piece of pure tin.)

This is then followed up by an ordinary hand plugger, to ascertain whether the gold has been properly condensed at all points. The above process is repeated until the operation is completed, the surface of the gold at last being thoroughly condensed by means of one of the smooth polished instruments of the set.

In filling large cavities on the grinding surface, first two, three or four cylinders of No. 1, 2 or 3 Wolrab foil are pressed against the bottom of the cavity with the pliers, and then with one of the *polished* instruments, *slowly* rotating, fixed in position; if it does not at once become firm, more gold is put in till it does; it is then condensed with No. 5, *rapidly* rotating, and this instrument is then used almost exclusively till the gold is all in; then No. 1–4 or 7 is used for condensing the surface.

Approximal cavities in the central incisors are treated as follows (previous separation by means of cotton having been secured) : The cavities are prepared slightly broader at the bottom than at the opening; no retaining points are required. Two or three cylinders of No. 2 Wolrab foil are pressed into the first tooth towards the gums, likewise into the second tooth, and condensed with No. 5; this process being repeated till both cavities are overfilled, so that the gold in the two fillings appears to form one continuous mass.

Then No. 15 (a clean, fine needle), slowly rotating, is pressed through between the filling at different points, and the separation completed with a fine file. The fillings are then further condensed by Nos. 12–14, rapidly rotating, with interrupted pressure."

The second day's meeting was held at the Harvard Dental School's building. Called to order at 9 o'clock, President William Barker, of Providence, in the chair. The first business was the election of officers for the ensuing year, which resulted as follows: President, James Lewis, M. D., D. D. S., Burlington, Vt.; First Vice-President, J. B. Coolidge, M. D., D. D. S., Boston; Second Vice-President, G. A. Young, D. D. S., Concord, N. H.; Secretary, A. M. Dudley, D. D. S., Salem, Mass.; Treasurer, G. A. Gerry, D. D. S., Lowell, Mass.; Librarian, G. F. Waters, D. D. S., Boston, Mass. Executive Committee, T. Fillebrown, M. D., D. M. D., Boston; D. B. Ingalls, D. D. S., Clinton; E. O. Kinsman, D. D. S., Cambridge; C. W. Clement, D. D. S., Manchester, and C. H. Osgood, D. M. D., Boston. The next meeting will be at Burlington, Vt., October, 1885. The balance of the session was given up to clinics and the examination of exhibits of dental appliances. Clinics were given in both the operating and laboratory rooms of the college. In the operating department the prominent clinics were the illustration of the Herbst method of gold fillings, by Dr. Bödecker, and the setting of crowns by Dr. How. In the laboratory a new method of Continuous Gum Work was illustrated by Dr. Timme of Hoboken. Clinics were also given in Tooth Carving; Dr. Seabury also exhibited his new rubber- and celluloid apparatus, showing its practical working, besides several clinical demonstrations of less importance by different individuals.

After the adjournment the society proceeded to visit the New England Mechanics' Fair in accordance with an invitation received from its managers. On the whole this was one of the best meetings which this important society has held. It was not as largely attended at all of its sessions, and the interest was not perhaps as absorbing, as at its

meeting at Providence, last year. More attention was given to the practical concerns of the profession and less to the scientific problems than at the Providence meeting, thus perhaps gratifying the largest number. About twenty-five names were added to the membership—making it more than two hundred—which probably makes this society the largest dental society in America, if not in the world. It certainly is one of the strongest and is well equipped for a prosperous future.

CORRECTION.—On page 330 of the September issue of our journal we spoke of "Dr. Weal (?) of Albany." As the interrogation mark shows, we then doubted the correctness of the name. "Dr. Weal" has been so kind as to inform us that his name is Dr. C. F. Wheeler, of Albany.

Dr. D. M. Clapp, of Boston, has utilized the electric current that flows over his house through the medium of the Electric Light Company's wires by making it operate his dental engine motor, thus avoiding the care and trouble of a battery. As far as we are informed this idea is original with Dr. Clapp. By a simple contrivance he can regulate, with the foot, the rapidity and power of the engine to suit the demand.

An excellent combination for the treatment of pyorrhœa alveolaris has been suggested by Dr. J. A. Robinson, of Jackson, Mich., viz: A combination of equal parts of caustic potash and carbolic acid rubbed together in a mortar so as to form a crystalline paste; cotton fibers are twisted together to the size of ordinary yarn and saturated with the mixture, which is pushed down into the pockets and left for awhile. The operation is painless, and one or two treatments are said to be sufficient to cure a most severe case of pyorrhœa alveolaris. The same remedy is said to give excellent results in obtunding the pain while cutting out a decay.

Dr. Robinson, who is a veteran in experience and practice, is very enthusiastic over the results obtained, and we advise all our readers to give the suggestion from such an old practitioner a thorough trial.